

Das Gesetz der Translation des Wassers. Von T. Christen, Oberförster. Pp. viii + 179; with one lithographed plate. (Leipzig: Wilhelm Engelmann; London: Williams and Norgate, 1903.)

MUCH has been written about the flow of water in pipes, channels, and rivers, considered from the point of view of the hydraulic engineer, and many attempts have been made to obtain empirical formulæ for purposes of numerical calculation. In this volume the author proposes the formula $v = k^2/(QI)^{1/2}/B$, where v is the mean velocity, Q the total flow per second, I the gradient as a sine, and B the half-breadth of the channel. A comparison of the results of the author's formulæ is made, both with the results of experiment and with those of other writers, especially Bazin, and calculations are given of the velocity curves for different sections and under different conditions. Reynolds's critical velocities are also discussed. The book contains a bibliography, tables of coefficients, and a diagram of the author's experiments and of velocity curves.

The new laws are admittedly only empirical, and the author indicates that many points might with advantage be discussed at greater length, but he has certainly succeeded in including a large amount of important and suggestive information in a book of small compass, and his theories will be read and discussed with the greatest interest by hydraulic engineers and experimenters who have worked in the subject.

Colloquies of Common People. By James Anstie, K.C. Pp. 530. (London: Smith, Elder and Co., 1902.)

THE English language contains few good specimens of the philosophical dialogue, perhaps none except the masterpieces of Berkeley. In attempting to revive this most difficult form of composition Mr. Anstie has ventured on a daring task, and I fear cannot be said to have achieved a great success. Like others before him, he forgets that a dialogue is intolerable unless its author is dramatist enough to confer individual character on the interlocutors; nothing is heavier reading than wedges of disquisition by mere puppets. Of the variety of topics handled by Mr. Anstie's puppets it is impossible to give any summary, as they appear to begin their discussion anywhere and to argue anyhow. They seem, however, in the course of his five hundred odd pages to touch on most of the current topics of ethics and psychology. The reader should at least have been assisted to follow their excursions by a table of contents and an index. A. E. T.

A Country Reader. II. By H. B. M. Buchanan, B.A. (Cantab.). Pp. viii + 233; with illustrations. (London: Macmillan and Co., Ltd., 1903.) Price 1s. 6d.

As Mr. Buchanan says, a child is much more likely to learn to read fluently and with intelligence if his reading book is concerned with subjects falling within his everyday experience, and from this point of view the set of readers, of which this is the second, will prove useful and popular in rural primary schools. The various sections of the book deal in simple, interesting language with the characters and uses of the goat, the donkey, the cat, our common reptiles, the fish of our ponds and streams, pastures and grasses. The illustrations are numerous and exceptionally good, though it is a pity the author has omitted to indicate the scale of the drawings; there is some fear, for instance, that quite a wrong idea of the relative sizes of the carp and minnow will be obtained by the pupil from the pictures which face one another on pp. 96 and 97.

NO. 1759, VOL. 68]

LETTERS TO THE EDITOR.

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Gases Occluded by Radium Bromide.

RUTHERFORD AND SODDY (*Phil. Mag.*, 1902, p. 582; 1903, p. 453 and 579) pointed out that the almost invariable presence of helium in minerals containing uranium indicated that that gas might be one of the ultimate products of the disintegration of the radio-elements. Rutherford, moreover, determined the mass of the projected particle which constitutes the "α-ray" of radium (*Phil. Mag.*, 1903, p. 177) to be approximately twice as great as that of the hydrogen atom, an observation which points in the same direction. These α-particles are readily absorbed by solids, and should accumulate in the solid salts of radium and in the radio-active minerals.

We have been engaged for some months in examining the spectrum of the "radio-active emanation" from radium, and during this work the opportunity presented itself of examining the gases occluded by 20 mgrs. of radium bromide which had been kept for some time in the solid state. These gases, which are continuously generated, have already been partially examined by their discoverer, Giesel, and by Bodländer (*Ber. deutsch. chem. Ges.*, 36, p. 347), and found to consist mainly of hydrogen and some oxygen. We have found that after removing hydrogen and oxygen from the gases evolved from 20 mgrs. of radium bromide, the spectrum showed the presence of carbon dioxide. On freezing out the carbon dioxide, and with it, a large proportion of the radium "emanation," the residue gave unmistakably the D_2 line of helium. This was confirmed by sealing off the tube, and comparing its spectrum with that of a helium tube. The coincidence of the two lines may be taken to be at least within 1/10th of the distance between D_1 and D_2 , or say 0.5 of an Ångström unit.

This observation, if confirmed, substantiates the theory already mentioned, and brings ordinary methods to bear on the changes occurring in radio-active bodies.

WILLIAM RAMSAY.

FREDERICK SODDY.

July 10.

P.S. (July 13).—We have repeated the experiment with 30 mgrs. of fresh radium bromide, kindly placed at our disposal by Prof. Rutherford, which had probably been kept for several months in the solid state. Entirely new apparatus was constructed for the purpose, and better precautions were taken to exclude from the spectrum tube carbon dioxide and the emanation. The spectrum was practically that of pure helium, with the addition of two new lines. The lines identified are:—

Red	6677	Green-blue ..	4932
Yellow (D_2) ...	5876	Blue	4713
Green	5016	Violet	4472

The additional lines are one in the red and one in the green; these we have been unable to identify.

The Extirpation of *Culex* at Ismailia.

I BEG to enclose for publication the translation of a report received from the general secretary of the Suez Canal Company regarding the effects of the anti-malaria campaign at Ismailia since the visit of Sir William MacGregor and myself last September. While it is obviously too early to speak definitely regarding the result on the malaria rate, the secretary is able to announce that mosquitoes of the genus *Culex* "ont été supprimés d'une manière presque

absolue." Under the term *Culex*, I think he means to include also gnats of the genus *Stegomyia*.

I have received confirmatory evidence from a gentleman in Egypt, who says that he was recently able to sleep at Ismailia without mosquito nets.

The campaign against *Culex* at Ismailia originally promised to be a difficult one, owing to the large number of sewage-cisterns under the houses, and the result shows how easily a simple and obvious idea like that of diminishing mosquitoes by dealing with their breeding places can be acted upon by an intelligent and effective executive which sets to work at once, instead of wasting time on useless discussions—as, for the most part, we have been doing in British possessions during the last four years.

It is to be hoped that, following the work of Gorgas at Havana, and Logan Taylor at Freetown, the result at Ismailia will be accepted as clinching the proof of the fact that *Culex*, at least, may be materially diminished in tropical towns.

RONALD ROSS.

Liverpool, July 11.

TRANSLATION of letter, dated July 2, from M. le Secrétaire général de la Compagnie universelle du Canal maritime de Suez, Paris, to Major Ronald Ross, Liverpool School of Tropical Medicine:—

"Sir,—I have the honour to inform you that, following your mission of last September, numerous works of drainage and filling up of ditches have been effected, and that a permanent department has been created for the purpose of oiling cisterns and pits and suppressing marshes and pools of water amongst the habitations of Ismailia. Moreover, measures of prophylaxis, consisting of the gratuitous distribution of quinine and arsenic, commenced in the month of April, 1902, are continued without interruption.

"Since last December, the number of cases of fever has very sensibly diminished by comparison with previous months and with the corresponding period of last year, and this decrease is maintained until to-day.

"Owing to the time at which the sanitary works were undertaken, the complete disappearance of the *Anopheles* is not yet realised, but it can be stated that recently captured insects have not been infected—which can perhaps be attributed to the fact that the number of cases of fever have been considerably reduced.

"On the other hand, it is interesting to note that, thanks to methodical *petrolage*, and to the incessant surveillance of the breeding-places of mosquito larvæ, the mosquitoes called *Culex* have been suppressed in a manner almost absolute, and that, in the hottest period of the year, it has been possible to abandon the use of mosquito nets.

"Regarding the consequence of these measures, a definite statement cannot be made until after August to November next, the principal malaria season. We have every ground for hoping that the efforts with which you have been so usefully associated will end in the complete extinction of malaria in the town of Ismailia, and we will communicate with you when we receive definite information on this interesting subject."

Another White Spot on Saturn.

ON July 9, at 14h. 4m., I observed another large white spot in the northern hemisphere of Saturn, and on the central meridian of the planet. The spot was quite bright in contrast with the dark belt adjoining it, and a tolerably easy object. I saw the spot again on July 12, when it shone with a bright pearl-like aspect, and was estimated on the central meridian at 12h. 50m. The marking is much distended in longitude, and this makes it rather difficult to note its central passages accurately, but the motion of the object seems decidedly swifter than the rate usually adopted for the rotation period of Saturn.

The following end of a bright extension on the eastern side of the spot was on C.M. at 13h. 35s. on July 12, and a dusky patch between the N equatorial belt and the polar shading followed at 14h. 1m.

The markings above alluded to are quite different from the bright spot seen by Barnard on June 23, and by myself on July 1. The present disturbance on Saturn seems to have affected a very large area, and I have never observed anything of the same conspicuous character on the planet in past years.

W. F. DENNING.

Bishopston, Bristol.

NO. 1759, VOL. 68]

The Thunderstorm of May 31.

MR. C. H. HAWKINS, of Croydon, has sent me a copy of a photograph of a lightning flash taken by him at "Addiscombe," Croydon, on Whitsunday morning, May 31, at 2.30 a.m.

The upper part of the main flash and the side flash both show reduplication, and the photograph exhibits so many



Lightning discharge photographed at Addiscombe, Croydon, on May 31, at 2.30 a.m. Direction N.N.W

characteristic features that its reproduction may be of service for comparison with other photographs.

I therefore enclose a copy with Mr. Hawkins's permission. Meteorological Office, S.W., July 7. W. N. SHAW.

THE LODGE-MUIRHEAD SYSTEM OF WIRELESS TELEGRAPHY.

THE system of wireless telegraphy which Sir Oliver Lodge and Dr. A. Muirhead have been developing for some years has, within the past few months, been brought to a degree of perfection which justifies the inventors in the belief that it is now of practical commercial value. Thanks to the courtesy of Messrs. Muirhead and Co., we have had an opportunity of seeing the system at work at a small experimental installation which has been put up in a field adjoining Messrs. Muirhead's works at Elmers End, Kent. At this station signals were being transmitted to and received from a similar installation at Downe. The distance between the two stations is only six or seven miles, but the chalky nature of the Kentish soil and the fact that the station at Elmers End lies in a hollow make this distance equivalent to eight or nine times as much over water. Experiments which have been made under the conditions which would obtain in the practical application of the system for maritime work and also over the Admiralty sixty-mile range have shown that, with the same power and the same adjustments as are required between Elmers End and Downe, thoroughly satisfactory communication can be maintained across sixty miles of ocean. Considerations of distance are, however, of secondary importance in estimating the merits of wireless telegraphy systems, for the recent work of Mr. Marconi and others has made it clear enough that, given sufficient power, almost any range can be attained. Trustworthiness, clearness, the design of circuits and apparatus, and the possibility of successful syntonisation are factors of greater importance. Looked at from this point of view, the Lodge-Muirhead system presents several novel and interesting features which show that, though it may be one of the latest to come into the field of practical wireless telegraphy, it is likely to prove one